

WHAT IS CLAIMED IS:

1. A track tensioning device for an endless track on a vehicle, said track tensioning device comprising a roller to engage an interior surface of  
5 a track, a spring assembly for urging the roller to provide tension in the track comprising first and second springs mounted to be loaded in series, the springs being of substantially different spring rates, a first of the springs having a lower spring  
10 rate than a second of the springs, a mechanical stop to prevent loading the first spring more than a selected amount, and thereafter the second spring providing load resisting movement of the roller caused by tension in the track.

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2. The track tensioning device of claim 1, wherein the springs are compression springs and said mechanical stop comprises a sleeve on an interior of the first spring, and an end slide plate engaging an  
20 end of the second spring, said sleeve having an end surface that bears against the slide plate when the first spring is compressed a selected amount.

3. The track tensioning device of claim 1, wherein the first and second springs are compression coil springs, and wherein said second spring is  
25 mounted in a spring assembly including an end slide plate on an end of the second spring spaced away from the roller, a rod mounted in an interior of the first

spring and extending slidably through the slide plate, the mechanical stop comprising a sleeve surrounding said rod and positioned on the interior of the first spring, an adjustment nut on the rod  
5 bearing against an end of said first spring opposite from the second spring, and said rod being anchored relative to a track frame to provide a reaction force when the springs are compressed.

10 4. The track tensioning device of claim 3, wherein said second spring is captured in an assembly including a slide guide and a base plate, said base plate being secured relative to the slide guide, a  
15 slide plate at an opposite end of said second spring from said base plate, a pair of guide rods fixed to the base plate and slidably mounted through said slide plate, whereby said slide plate can slide along the guide rods when the second spring compresses, and  
20 retainers on said guide rods to pre-load the second spring and hold the slide plate in a position with the second spring under a selected compression.

5. The track tensioning device of claim 2, wherein said first spring is mounted to have a first  
25 end engaging the slide plate and to extend in a direction away from the roller to a second end, a reaction member engaging the second end of the said first spring and being restrained relative to a track frame to stop the first spring from movement in a

direction away from said second spring, and the  
mechanical stop being carried by the reaction member  
and being of a selected length to engage the slide  
plate after the first spring has compressed a selected  
5 amount.

6. The track tensioning device of claim 5,  
wherein said reaction member comprises a threaded shaft  
and a nut, said threaded shaft passing through the stop  
10 member and the first spring and slidably mounted  
relative to the slide plate of the second spring, and a  
bracket for holding the threaded shaft from axially  
movement relative to a track frame in a direction away  
from the second spring.

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7. A pretensioned spring track tensioning  
assembly comprising a tensioner arm for mounting a  
rotating tension roller for engaging a vehicle drive  
track, said arm having a slide attached thereto and  
20 extending in a direction away from the mounting for the  
roller, the slide mounting first and second springs end  
to end and of different spring rates, the second spring  
having a first end that is anchored relative to the arm  
to prevent the second spring from moving toward the  
25 mounting for the roller, and the first spring being  
mounted, an end of said second spring opposite from the  
first end of the second spring, a slidable plate  
between the adjacent ends of the first and second  
springs, a spring retainer slidably mounted relative to

said slidable plate and secured relative to the arm when the second spring is in place, a guide slidably mounting said slide plate and having retainers thereon to provide for compressing the second spring and  
5 retaining the second spring after compression to a desired position, a reaction member engaging an end of the first spring opposite from the second spring and being adapted to be secured from axial movement relative to a track frame to react loads on the  
10 tensioner arm tending to compress the first and second springs, and a stop member to limit the amount of compression of the first spring when the tensioner arm is loaded in a direction to provide a force against the reaction member.

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8. The pretensioned spring assembly of claim 7, wherein said reaction member comprises a shaft, said shaft being mounted in the center of said first spring and slidably extending through said slide plate, and  
20 wherein said stop member is carried with said shaft, such that when the first spring has compressed a selected amount the stop member engages the slide plate and further movement of the tensioning arm toward the reaction member loads the second spring through the  
25 slide plate and stop member.

9. The pretensioned spring assembly of claim 8, wherein the reaction member further comprises a nut

threadably movable on the shaft, the nut having a flange to engage the first spring.

10.           The pretensioned spring assembly of claim 9,  
5   wherein the shaft is rotatably secured to the track frame.

11.           The pretensioned spring assembly of claim 9,  
wherein the reaction member includes a reaction plate  
10   mounted to carry compression loads from the springs to the track frame, the shaft being rotatable relative to the reaction plate.

15   12.           The pretensioned spring assembly of claim 11 and a lock plate to selectively lock the shaft from rotation relative to the reaction plate.